



RESEARCH ARTICLE

A survey exploring biomedical editors' perceptions of editorial interventions to improve adherence to reporting guidelines [version 1; peer review: awaiting peer review]

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Abstract

Background: Improving the completeness of reporting of biomedical research is essential for improving its usability. For this reason, hundreds of reporting guidelines have been created in the last few decades but adherence to these remains suboptimal. This survey aims to inform future evaluations of interventions to improve adherence to reporting guidelines. In particular, it gathers editors' perceptions of a range of interventions at various stages in the editorial process.

Methods: We surveyed biomedical journal editors that were knowledgeable about this topic. The questionnaire included open and closed questions that explored (i) the current practice of their journals, (ii) their perceptions of the ease of implementation and the potential effectiveness of different interventions, (iii) the barriers and facilitators associated with these interventions, and (iv) suggestions for future interventions and incentives.

Results: Of the 99 editors invited, 24 (24%) completed the survey. Involving trained editors or administrative staff was deemed the potentially most effective intervention but, at the same time, it was considered moderately difficult to implement due to logistic and resource issues. Participants believed that checking adherence to guidelines goes beyond the role of peer reviewers and could decrease the overall quality of reviews. Journals incentivising adherence, and publishers and medical institutions encouraging journals to adopt strategies to boost adherence were two recurrent themes.

Conclusions: Further evaluation of interventions are required. These evaluations could take into account the points raised in this survey.

Keywords

Completeness of reporting, Journal policies, Quality of reporting, Reporting guidelines, Survey, Barriers, Facilitators

Open Peer Review

Reviewer Status Awaiting Peer Review

Any reports and responses or comments on the article can be found at the end of the article.



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Abbreviations

RGs: reporting guidelines; CONSORT: Consolidated Standards of Reporting Trials; RCT: Randomised controlled trials; EQUATOR: Enhancing the QUALity and Transparency Of Health Research; MiRoR: Methods in Research on Research; STROBE: STrengthening the Reporting of OBservational studies in Epidemiology; PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; APCs: article processing charges; CME: continuing medical education; ICJME: International Committee of Medical Journal Editors.

Introduction

Transparent and accurate reporting of research is essential for increasing the usability of available research evidence¹. Reporting guidelines (RGs) can be useful tools to help authors report research methods and findings in a way that they can be understood by readers, replicated by researchers, used by health care professionals to make clinical decisions, and included in systematic reviews¹. Since the inception in 1996 of the Consolidated Standards of Reporting Trials (CONSORT) for the reporting of randomised controlled trials (RCTs)², more than 400 RGs for different study types, data, and clinical areas have been developed. These RGs can be found in the library of the Enhancing the Quality and Transparency Of Health Research (EQUATOR) Network¹.

Biomedical authors' adherence to RGs has been observed to be suboptimal³. Consequently, in recent years various stakeholders have proposed, and sometimes evaluated, the impact of different types of interventions to improve this adherence. These interventions were identified and classified in a recently published scoping review⁴. We found that the strategies most widely used by journals have been shown not to have the desired effect^{5–8} and this highlighted the need for the implementation and evaluation of the other interventions proposed⁴.

This paper reports a survey aimed to inform the future evaluation of interventions to improve adherence to RGs. In particular, we focused on interventions that can be implemented at various points in the editorial process. Our specific objectives were to explore the perceived ease of implementation and potential effectiveness of various interventions; to map the barriers and facilitators associated with these interventions; to determine possible solutions to overcome the barriers described, and to identify further editorial interventions that could be implemented and subsequently evaluated.

Methods

Participants

Purposive sampling was used to recruit biomedical editors that were knowledgeable about the topic we aimed to explore. Participants were sampled from three sources: (i) editors of journals that had published studies describing interventions to improve adherence to RGs identified in our scoping review⁴, (ii) members of the Methods in Research on Research (MiRoR) Network with current editorial positions and (iii) editors of the top-10 journals (based on impact factor) of BMJ Publishing Group which, apart from being one of the partner institutions of MiRoR, has published the main RGs^{9–12} and

has traditionally performed research to improve the transparency and quality of biomedical publications¹³. The authors of this survey who met the eligibility criteria were excluded as potential participants.

Procedure

To contact editors not known to us we sought email addresses in the public domain. Three editors (including the editors-in-chief) of each of the sampled journals, as well as individual editors from the group (ii) above, were sent a personalised email inviting them to complete an online survey investigating their opinions about different editorial interventions to improve author adherence to RGs. The survey was administered by [SurveyMonkey](#) and was open between 27 November 2018 and 24 February 2019. Each survey invitation was tied to a unique email address. Two reminders to complete the survey were sent to non-responders at four and eight weeks after the initial mailing. Participants could edit their responses while completing the survey, but not re-enter the survey once it was completed. We recorded how many people opened the invitation or clicked through to the survey, as well as the number of surveys completed. Participants could suggest further editors that they considered could contribute to the survey. These participants were also sent a personalised invitation.

Questionnaire development

Our previous scoping review⁴ identified 31 interventions targeting different stakeholders in the research process. For use in this survey we chose a smaller subset of nine interventions that could be implemented during the editorial process as our focus was on journal editors' perceptions (see [Box 1](#)).

Box 1. Interventions included and their targets.

A. Interventions targeting authors:

- A requirement for authors to submit a completed RG checklist (using all appropriate extensions, if applicable) indicating the page numbers where each item is addressed (**Intervention 1**)
- A requirement for authors to submit a populated RG checklist with text from their manuscript in order to facilitate the peer review process (**Intervention 2**)
- A requirement for authors to highlight in the manuscript where each RG item is addressed (**Intervention 3**)
- A requirement for authors to include new subheadings within their manuscript corresponding to different RG items within the traditional IMRaD format (Introduction, Methods, Results, and Discussion) (**Intervention 4**)
- A requirement for authors on submission to use a freely available writing aid tool that guides authors through the RG checklist items, shows the key elements that need to be reported, and includes examples of adequate reporting (e.g. COBWEB) (**Intervention 5**)

B. Interventions targeting peer reviewers:

- Instruct peer reviewers to use the appropriate RGs when assessing a manuscript (**Intervention 6**)
- Instruct peer reviewers to scrutinise the completed RG checklist submitted by the authors and check its consistency with the information reported in the manuscript (**Intervention 7**)

C. Interventions targeting editorial staff:

- An evaluation of the completeness of reporting by a trained editor (or editorial assistant), who would return incomplete manuscripts to authors before considering the manuscript for publication (**Intervention 8**)

D. Interventions targeting authors, peer reviewers, and editors:

- Training for authors, peer reviewers, and editors on the importance, content, and use of RGs (e.g. The EQUATOR Network toolkits) (**Intervention 9**)

The survey combined open and closed response questions to seek participants' perceptions of a series of interventions to improve authors' adherence to RGs that could potentially be implemented during the editorial process. We pilot tested the draft survey questionnaire with two collaborators of the MiRoR project who currently hold editorial positions. They were asked to review the survey for its clarity and completeness and to provide suggestions on how to improve its structure.

Based on feedback from the pilot we decided not to include the intervention "Implementation of the automatic tool Statreviewer¹⁴" since participants were not aware of this software and stated that their perceptions would strongly depend on details about how it operates which are not publicly available.

We structured the final questionnaire (see Figure S1, *Extended data*)¹⁵ as follows:

- *Part 1: Current practice.* Participants were asked to describe the measures their journal currently takes to improve adherence to RGs.
- *Part 2: Perceptions of nine potential interventions.* Participants were asked to indicate on 5-point Likert scales (i) how easy it would be (or was) to implement these interventions at their journals (1-very difficult, 2-moderately difficult, 3-neither difficult nor easy, 4-moderately easy, 5-very easy) and (ii) how effective they thought the interventions would be (or was) at improving adherence to RGs if these were implemented at their journals (1-very ineffective, 2-moderately ineffective, 3-neither ineffective nor effective, 4-moderately effective, 5-very effective). We included images to clarify meanings and context to prompt participants to think about the benefits and drawbacks of the interventions. Free text boxes were included so participants could justify their responses.
- *Part 3: Identifying the barriers and facilitators.* Participants were asked to choose which intervention they considered potentially the most effective for their journal. They were asked to describe (i) why they thought that intervention would be the most effective, (ii) what the main difficulties in implementing that intervention would be, and (iii) how they would try to overcome these difficulties.
- *Part 4: Further interventions.* Participants were asked for further suggestions of possible interventions,

including modifications and combinations of the interventions previously discussed.

- *Part 5: Demographic questions.*

Data analysis

Descriptive statistics were calculated for quantitative data using R version 3.6.0¹⁶. For qualitative information, the lead investigator (DB) used the software program NVivo 12¹⁷ to extract data and classify the data into key themes. This classification was discussed with another investigator (SS) and subsequently refined.

For Part 1 of the survey (*Current practice*) the unit of measure were the journals and therefore editors of the same journal were grouped. For all other parts of the survey, we analysed editors' responses independently, no matter what their journal was.

Ethics approval & informed consent

The Research Committee of the Governing Council of the Universitat Politècnica de Catalunya (UPC) granted ethical approval for this study (Reference EC 01, Date 2 May 2018).

Participants were informed that completion of the survey indicated consent to participate, and that they were free to stop and withdraw from the study at any time without providing a reason.

Reporting guidelines

We consulted the Checklist for Reporting of Results of Internet E-Surveys (CHERRIES)¹⁸ and the Consolidated criteria for Reporting of Qualitative research (COREQ)¹⁹ guidelines to produce this research report.

Results

Of the 99 editors invited, 42 opened the invitation (view rate 42%), and 24 completed the survey (response rate 24%) from the 25 who started it (completion rate 96%). The average time spent completing the survey was 15 minutes (SD = 8.5 minutes). The 24 participants were editors of 20 different biomedical journals and had a variety of editorial roles (editor-in-chief, senior editor, associate editor or others). Most of them were involved in manuscript decision-making and had less than 15 years of experience as journal editors. Table 1 shows their demographic characteristics. Raw survey results are given as *Underlying data*²⁰.

Current practice

Respondents worked at 20 journals. Most respondents' journals (12/20, 60%) request authors to submit a completed RG checklist with page numbers indicating where the items are addressed when they submit their manuscript. A further seven (35%) instruct but do not request authors to do it, and one (5%) does not request or instruct authors. Among the journals requesting the submission of checklists, four (4/12, 33%) also explicitly ask peer reviewers to use the completed RGs when assessing manuscripts, one (1/12, 8%) asks peer reviewers general questions about the completeness of reporting, and one performs an evaluation of the completeness of reporting by

Table 1. Demographic characteristics of the 24 participants.

N=24		
Current position	Working full time as a journal editor	8 (33%)
	Working part time (equal or more than 0.5 of their time) as a journal editor	1 (4%)
	Working part time (less than 0.5 of their time) as a journal editor	14 (59%)
	Other (Volunteer editor)	1 (4%)
Editorial role	Editor-in-chief	10 (41%)
	Senior editor	4 (17%)
	Associate editor	4 (17%)
	Other (Editorial director, Technical editor, Assistant editor)	6 (25%)
Involvement in manuscript decision-making	Yes	22 (92%)
	No	2 (8%)
Years of experience as a journal editor	<5	8 (33%)
	5–15	12 (50%)
	15–25	3 (13%)
	>25	1 (4%)

a trained editor using RGs before the initial decision is made on the paper. We observed no incongruences between the answers of editors from the same journal. Some respondents mentioned that in their journals (n=4) the interventions described were only applicable to the study types corresponding to the most established RGs (CONSORT, STROBE, or PRISMA) for trials, observational studies and systematic reviews respectively.

Perceptions of nine potential interventions

The mean scores for perceived ease of implementation and potential effectiveness for each intervention are shown in Figure 1.

The two most common interventions were considered the easiest ones to implement: the mean scores for requesting authors to submit checklists with page numbers (Intervention 1) and for asking peer reviewers to use RGs (Intervention 6) were 4.33 (SD=0.90) and 3.67 (SD=1.14), respectively. By contrast, interventions related to training (Intervention 9), editor involvement in checking completeness of reporting (Intervention 8) and reformatting of the text based on RG requirements (Intervention 4, Intervention 5) were considered the most difficult to implement.

An evaluation of the completeness of reporting by a trained editor was considered the most effective intervention (4.09, SD=1.02) and the two targeting peer reviewers (Interventions 6 and 7) were perceived as being the least effective (3.13, SD=1.17; 2.96, SD=1.06). All interventions targeting authors (Interventions 1-5) and training (Intervention 9) ranged between 3.3 and 3.6.

Identifying the barriers and facilitators

This section presents the perceived barriers and facilitators of the interventions considered and editors' suggestions for making the interventions more effective. Table S1 in *Extended data*¹⁵ shows a full description of these.

A) Interventions targeting authors (1-5)

The main barriers associated with all of the interventions targeting authors was that authors have to state their adherence to the relevant RG and this does not equate to actual compliance. Moreover, it is resource intensive for journals to check that these requirements are appropriately met by authors. Some editors highlighted that Interventions 3, 4, and 5 would involve special formatting of the submitted manuscript, which could be cumbersome for authors given that manuscripts are often submitted to multiple journals with different formats before being accepted. This is particularly relevant for journals with high rejection rates as it could cause frustration for authors. Some participants mentioned logistical issues as their journal's manuscript tracking system is not set up to accommodate these interventions. In addition, changes in the manuscript's format could be incompatible with the journal's house style.

Intervention 1 was generally considered quick and straightforward for authors, but several participants indicated that there is published empirical evidence of little effectiveness if the checklist is not assessed by a trained editor or administrator⁵⁻⁸.

As Interventions 3, 4, and 5 force authors to tailor the manuscript to RG requirements, participants reported that these could

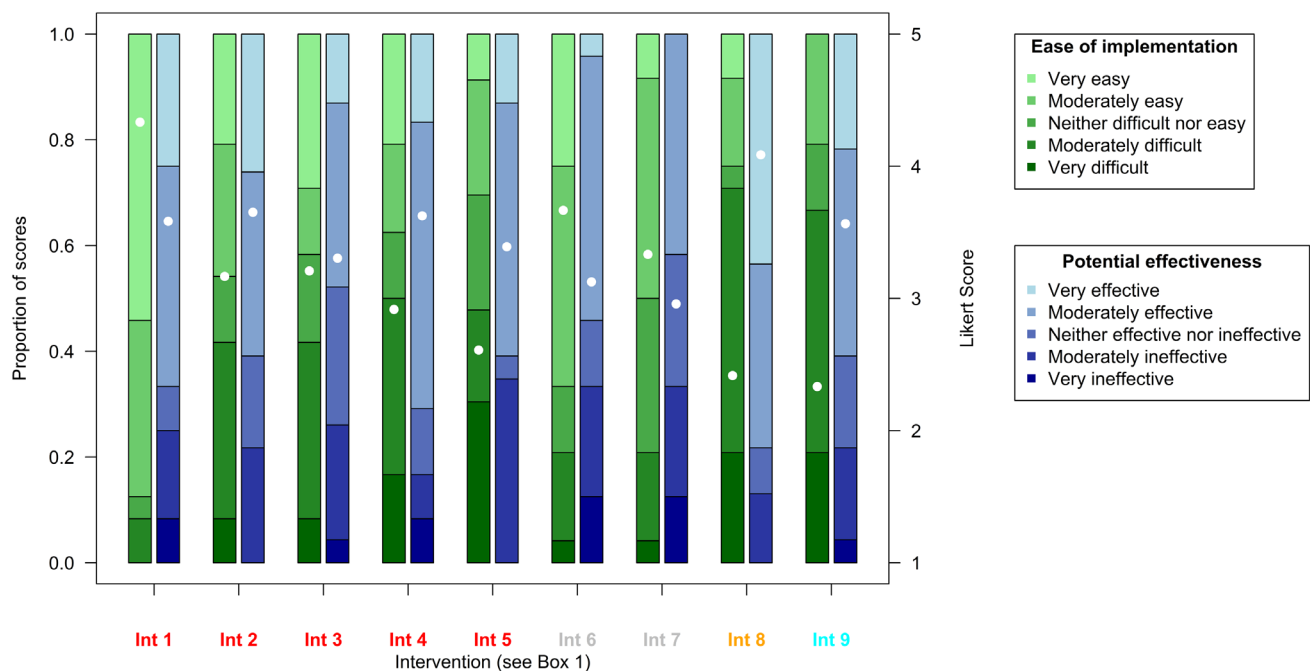


Figure 1. Scores for perceived ease of implementation and perceived effectiveness. White dots represent the mean scores for each of the categories. Interventions in red target authors, those in grey target peer reviewers, the one in orange target editors or administrative staff and the one in blue targets all these stakeholders. An explanation of the content of each intervention can be found in [Box 1](#).

make editors' and peer reviewers' jobs easier as the manuscript would be better structured. Importantly, readers would also be able to locate information more easily. Some editors pointed out that, to make these interventions effective, journals would need to provide templates to authors or to integrate these interventions in the submission system. However, some of these interventions (Interventions 2 and 5) were seen as more effective if they were implemented earlier on in the research process, prior to writing the manuscript.

B) Interventions targeting peer reviewers (6, 7)

Most respondents were negative about the potential effectiveness of implementing the two interventions targeting peer reviewers (Intervention 6 and 7) as they felt these would create too much additional work for reviewers. Participants were concerned that the quality of peer review could be compromised as reviewers should focus on the manuscript's content and not on the reporting issues. Furthermore, peer reviewers may not know which RGs to use and, even if they do, the effectiveness would be dependent on their willingness to use RGs and their expertise in applying them. Several participants indicated that this work should be delegated to paid editorial staff.

C) Interventions targeting editorial staff (8)

This intervention was considered difficult to implement but potentially effective. The main facilitating factor for its successful implementation was that it is performed by a paid or trained professional, which lends credibility to the intervention, reduces the workload of unpaid peer reviewers, and avoids

authors overclaiming adherence. The main barriers outlined for this intervention were (i) the budget issues the journal would need to face to train or hire additional editorial staff that could perform the evaluation, especially if the journal receives a large volume of papers, (ii) the editorial delays it may cause, and the (iii) the potential inefficiency of assistant editors or administrators having to delegate decisions in case of doubt, given that sometimes assessing completeness of reporting is a subjective task.

To make this intervention more feasible for journals, editors suggested that the completeness of reporting evaluation could be performed only for papers that are sent out for peer review and, it could be focused on a few core items (different for each RG) that would enable reproducibility. If this intervention was implemented in a journal that requires the submission of a completed checklist, editors could take advantage of the checklist to locate information.

D) Interventions targeting authors, peer reviewers and editors (9)

Training was seen as a potentially effective intervention but difficult to implement. Some participants highlighted that training with follow up sessions would be resource intensive for journals, and especially difficult to enforce. One participant mentioned that credits (such as CME credits²¹) could be used to recognise hours of training. The fact that sometimes the editorial staff is based in different places and zones makes it crucial to consider flexible forms of training, such as online

courses. As an example, the EQUATOR Network Toolkits section provides resources for authors, peer reviewers and journal editors²². However, some participants emphasised that training should also be delivered by research institutions and medical centres.

Further interventions and incentives for authors and journals

The implementation of reading tools that automatically assess adherence to RGs, such as *Statreviewer*¹⁴, were seen as potentially interesting interventions. Some respondents also mentioned the possibility of combining some of the interventions listed, such as requiring the submission of checklists and trained editors assessing the responses with the information reported in the manuscript.

Moreover, several incentives for authors were listed, including (i) discounts on article processing charges (APCs) for authors that comply with RG requirements, (ii) academic institutions including RG use in the promotion and tenure files, and (iii) credits (such as CME credits²¹) to recognise hours of training on the use of RGs. Journals could also be encouraged to implement certain interventions if (i) there is empirical evidence that these interventions actually improve the reporting quality of the papers or (ii) publishers or the International Committee of Medical Journal Editors (ICMJE) mandate these as a condition of submission to their journals. Even if some of these interventions are proven to be effective, some respondents reported that it is essential to convince publishers that improving the quality of reporting is a worthy investment to resource.

Discussion

This survey explores biomedical journal editors' perceptions of the practical aspects of the implementation of different interventions to improve adherence to RGs.

Several messages arise from this study. First of all, most editors agreed that the most effective way to improve adherence to RGs is for journals to involve trained editors or administrative staff. Interventions targeting these stakeholders were considered to be difficult to implement for most journals, either because of logistic or resource issues. However, improving the performance of editorial staff is critical²³ and has been shown to have a positive impact on completeness of reporting in the context of a dentistry journal²⁴. To make these type of interventions more feasible, journals could implement them only for manuscripts that are sent out for peer review. The editorial staff could also take advantage of the RG checklists submitted by authors, that could be automatically populated with text using specific software such as the tool proposed by Hawwash *et al.*²⁵

Most editors considered that checking reporting issues is beyond the role of peer reviewers. Given the voluntary nature of peer review, requiring reviewers to use RGs causes an additional workload that could compromise the overall quality of the reviews. Furthermore, as finding peer reviewers is becoming increasingly difficult for editors²⁶, these requirements could

make them even less willing to review papers. Additionally, some editors considered that the average peer reviewer does not have enough expertise to go over RG requirements.

We observed that the interventions perceived as potentially most effective appear to be more difficult to implement. Conversely, the most common strategies seem to have been implemented based on their feasibility and not on their potential to improve completeness of reporting. This could be one of the reasons why they have failed to achieve the desired results⁵⁻⁸. Some of our respondents insisted that a key element is that journals, universities, and medical institutions find ways to incentivise author's compliance with RGs. At the same time, the scientific community needs to find ways to convince publishers that improving the quality of reporting is a worthy investment so that publishers can encourage their journals to adopt strategies to boost completeness of reporting. A recent article indicates that implementing RGs through the editorial process may increase the number of citations to the research reported²⁷.

A common observation by the survey participants was that the effectiveness of the interventions proposed could depend on the types of articles considered. While RGs for randomised trial protocols, randomised trials or systematic reviews are more established, some others, including most RG extensions, are not well known to the stakeholders involved in the publication process. For this reason, it is important for journals to be clear in their "Instructions for Authors" on what RGs they mandate.

We encourage researchers to perform further evaluations of interventions in collaboration with biomedical journals, such as the RCT our research team is currently undergoing²⁸. Our study aims to evaluate the effect on completeness of reporting of a trained researcher assessing during peer review the consistency between the CONSORT checklists submitted by authors and the information reported in the manuscript, and providing authors with a report indicating any inconsistencies found.

Providing high quality evidence of the effectiveness of different interventions to improve adherence to RGs and discussing how to make them less burdensome are key aspects needed to convince all stakeholders that this effort is worth it.

Data availability

Underlying data

Zenodo: Underlying data of the project "A survey exploring biomedical editors' perceptions of editorial interventions to improve adherence to reporting guidelines". DOI: <https://doi.org/10.5281/zenodo.3407725>²⁰.

This project contains the following underlying data:

- Survey dataset (Dataset including all survey responses).

Extended data

Zenodo: Extended data of the project "A survey exploring biomedical editors' perceptions of editorial interventions to

improve adherence to reporting guidelines". <https://doi.org/10.5281/zenodo.3404002>¹⁵.

This project contains the following extended data:

- Figure S1: Survey questionnaire (Complete version of the survey questionnaire used in this project)
- Table S1: Barriers, facilitators and possible improvements of the included interventions (Table containing the barriers, facilitators and possible improvements identified for each of the interventions explored in the survey)

Data are available under the terms of the [Creative Commons Attribution 4.0 International license](#) (CC-BY 4.0).

Acknowledgments

The authors thank the MiRoR Project and Marie Skłodowska-Curie Actions for their support. This survey is the second part of a larger project whose first part was a scoping review to identify and classify interventions to improve adherence to RGs⁴. The third part is an RCT to evaluate the impact of assessing during peer review the CONSORT checklist submitted by authors²⁸.

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